

Claims

Sub B1

1. A trocar comprising:
- (a) a cannula assembly comprising a cannula and a cannula housing;
 - (b) a trocar assembly comprising a sharp trocar tip, an obturator shaft, and a trocar housing;
 - (c) means associated with the obturator shaft which releasably maintains the trocar tip in an *extended* position; *relative to what.*
 - (d) means for releasing the releasable obturator means; and
 - (e) biasing means for retracting the trocar tip from *[said, to]* a retracted position in response to release of the releasable obturator means.

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2. The trocar of claim 1, wherein said cannula is lanced or notched to form an internal shelf and said internal shelf is adapted to cooperate with said releasable obturator means to maintain said trocar tip in said first *extended* ~~extending~~ position.

3. The trocar of claim 1, wherein said releasable obturator means comprises a latch and a spring biasing said latch radially outward.

4. The trocar of claim 1, wherein said means for releasing the obturator means comprises a pawl.

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5. The trocar of claim 4, wherein said trocar tip is mounted to an extension member, said extension member is reciprocally mounted to said obturator shaft, and said pawl is mounted *to* said extension member.

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6. The trocar of claim 1, wherein said trocar assembly further comprises an extension member *5* and said trocar assembly further comprises an extension member and *2* said trocar tip is mounted to said extension member.

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7. The trocar of claim 6, wherein said extension member is reciprocally mounted to said obturator shaft and is spring-biased away from said obturator.

8. The trocar of claim 7, wherein said releasable obturator means maintains said trocar tip in a first extended position in which said extension member is in a spaced relation with respect to said obturator shaft and a second extended position in which said extension member is proximate said obturator shaft.

9. The trocar of claim 8, wherein said extension member assumes said second extended position in response to a counterforce being applied to said trocar tip.

10. The trocar of claim 8, wherein said means for releasing said releasable obturator means effects said release from said second extended position.

11. The trocar of claim 10, wherein said means for releasing said releasable obturator means comprises a pawl and said pawl releases said releasable obturator means when said extension member moves away from said proximate position relative to said obturator shaft.

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12. The trocar of claim 1, wherein said trocar assembly further comprises an indicator means which signals the position of said trocar tip.

13. The trocar of claim 1, wherein said means for releasing the releasable obturator means and said biasing means automatically retract said trocar tip to said retracted position in response to removal of a counterforce from said trocar tip.

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14. The trocar of claim 1, further comprising means for manually effecting retraction of said trocar tip ~~from~~ ^{from} said extended position to said retracted position.

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15. A trocar comprising:

- (a) ^a ~~A~~ cannula assembly comprising a cannula housing;
 - (b) a trocar assembly comprising a sharp trocar tip, an obturator shaft, an outer trocar housing and an inner trocar housing, said inner trocar housing and outer trocar housing being reciprocally mounted to each other;
 - (c) means associated with the obturator shaft which releasably maintains the trocar tip in a first extended position;
 - (d) means for releasing the releasable obturator means; and
 - (e) biasing means for retracting the trocar tip to a second retracted position in response to release of the releasable obturator means.
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B 16. The trocar of claim 15, wherein said inner trocar housing and outer trocar ^{tip} housing are in ~~spaced~~ relation when said ~~trocar~~ is in said retracted position, and wherein approximation of said inner and outer trocar housings moves said trocar tip into said extended position.

17. The trocar of claim 15, further comprising means for manually effecting retraction of said trocar tip from said extended position to said retracted position.

18. A method for inserting a trocar, comprising:

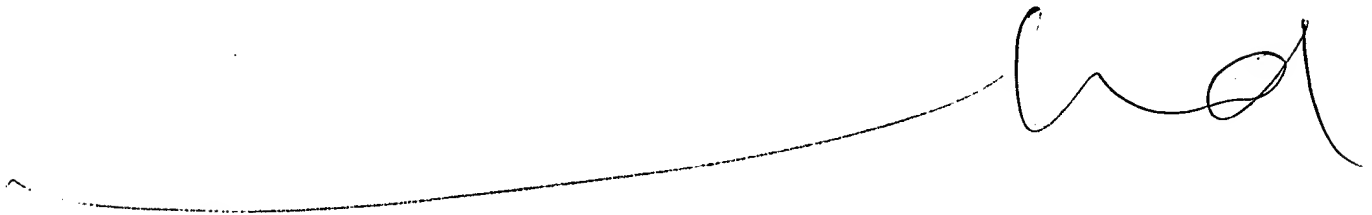
d | (a) advancing an obturator and a trocar tip to expose said trocar tip ~~from~~ ^{from} a cannula, said trocar tip being maintained in said exposed position by means associated with said obturator;

p | (b) pressing said trocar tip against a body wall, said body wall thereby exerting a counterforce against said trocar tip;

P | (c) entering said trocar tip into a body cavity, thereby removing said counterforce from said trocar tip and actuating release means associated with said obturator shaft to release said maintaining means, whereby said trocar tip is automatically withdrawn into said cannula under the action of a biasing means.

19. The method of claim 18, wherein said maintaining means comprises a latch adapted to cooperate with a shelf lanced or notched into said cannula.

20. The method of claim 18, wherein said release means comprises a pawl adapted to contact and release said maintaining means.



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